

## OPTIMIZATION OF A BINARY TREE TRAVERSAL WITH SECURE COMMUNICATIONS

### ABSTRACT OF THE DISCLOSURE

Methods and systems for the negotiation of a population of RFID tags with improved security is provided. In one aspect, a binary traversal is performed to singulate tags without using information that directly identifies the tags in the tag population. A key is generated to identify each RFID tag of the population of RFID tags. The generated key does not include bits identifying an item with which the particular RFID tag is associated. A binary tree algorithm is operated to identify one or more tags in the population of RFIDs tags using the generated keys. In another aspect, frequency hopping and/or spread spectrum techniques are used to provide improved security while negotiating tags. In another aspect, the reader causes the tags to scroll series of bits back to the reader for each bit sent to the tags to provide improved security.

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